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Abstract

In this paper we discuss an incumbent postal operator's incentives to invest in an innovation in the face of upcoming liberalization and deregulation of the letter market. Our contribution is a short description of recent innovations in the Swiss mail market and their interpretation in light of an illuminative yet tractable model. Following the literature, we distinguish between product and process innovation. We characterize competitive pressure by a reduction in the incumbent's market share and an increase of his/her perceived price elasticity of demand due to consumers' switching to competitors. This may result in adverse incentives to invest in an innovation. Likewise, deregulation leads to increased entrepreneurial freedom on the operator's side and possibly a lower burden of USO (universal service obligations), reflected in lower cost. This sustains incentives to invest in both product and process innovation.

1. Introduction

Liberalization of the postal market is under way in the EU (European Union) as well as in Switzerland. Particularly, the reserved area securing the incumbent postal service providers' monopoly position for letter mail conveyance is supposed to disappear soon. In the EU the reserved area is generally confined to mail weighing less than 50 g since the beginning of 2006, whereas in Switzerland this limit has been set to 100 g on 1 April 2006. It is often put forth that such market opening and the emergence of competition will finally be able to foster innovation in a sluggishly developing postal sector. This paper challenges that view and discusses the effects of liberalization and deregulation in the postal sector on the incumbent's motivation to innovate. We argue that stringent governance by the operator's owner and partial deregulation has well served as a driver for innovation in recent past and that competition in the mail sector will unlikely further increase them. The paper's contribution is a discussion and analysis of recent innovations in the Swiss mail sector. While also specific entrant strategies such as cream-skimming may influence the incumbent operator's incentives to innovate, we abstract from such considerations and confine our argument to three general effects of competition and deregulation, namely—an increase in perceived price elasticity of demand, a loss of market share, and a decrease in unit-processing cost.

1.1 Related Literature

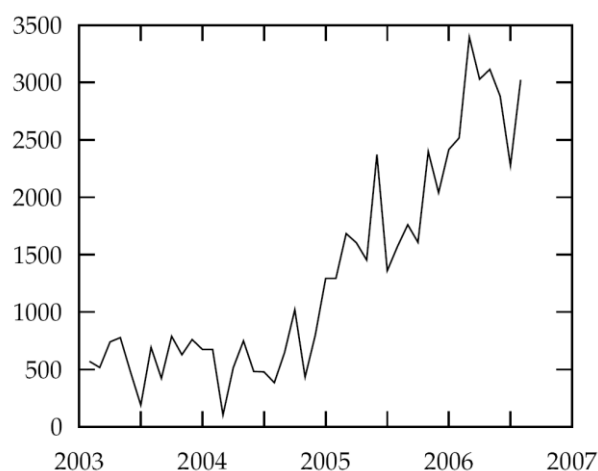
Early literature in the field of industrial organization predicted that innovation should decline with competition because increase in competition reduces monopoly rents that reward

innovative entrants (Dasgupta and Stiglitz 1980; Caballero and Jaffe 1993). Subsequent empirical work has found a positive correlation between competition and innovation which has spurred theoretical considerations explaining these findings. Aghion, Dewatripont, and Rey (1999) introduced competition as an incentive device into a Schumpeterian growth model. Aghion, Harris, Howitt, and Vickers (2001) extend that model by allowing incumbent firms to innovate. There, competition may increase the profits from innovation and encourage investments aimed at escaping competition. Aghion, Bloom, Blundell, Griffith, and Howitt (2005) argue that in levelled industries innovation incentives are higher than in unlevelled ones, reducing the fraction of industries of the former type in competition. They derive predictions of that model and confront them with data from a panel of firms from the UK. Their main finding is that low levels of competition spurs innovation by supporting attempts to escape such rivalry, while at high levels of competition, the laggard's reward to catching up with the technological leader falls. Aghion, Blundell, Griffith, Howitt, and Prantl (2006) adapt this kind of reasoning to the analysis of entry on innovation incentives to an incumbent firm. Also, Boone (2001) finds a non-monotone relation between intensity of competition and the incentives to innovate. Dietl, Felisberto, Finger *et al.* (2005); Dietl, Grütter, and Lutzenberger (2006) analyse the effect of regulation and deregulation of letter markets on process and product innovation under various regulatory scenarios.

1.2 Product innovation in the Swiss mail sector

In recent years, Switzerland experienced a series of product innovations in the mail sector. Figure 1 displays revenues generated by new mail products at the Swiss Post which serves as a good proxy for product innovation. At first glance it seems compelling that progressive liberalization (or the expectation of it) must have had a major impact on innovation.

Figure 1 Revenue from new products at Swiss Post Mail (in thousand Swiss Francs (CHF) per month)



Source: Swiss Post

It is typical for the Swiss mail market that this performance measure has been introduced only in 2003. Since then the management is accountable for new products and processes. Earlier, product innovation was obviously not an important issue but there has been a steady increase in product innovation since 2004. Products are considered new during their first three years of existence. In the considered time period, the products specified in Table 1 fell into this category. Most of these either reflect the positive trend in the use of direct marketing or depend directly on the emergence of the ubiquitous availability of telecommunication technology.

Table 1 Recent product innovations at Swiss Post Mail

2003	Direct Response Card; Direct Marketing Services; Hybrid Post; Geo Post; Mail2Paper
2004	Direct Response Card; Hybrid; Virtual Direct Mail; Promo partially addressed; Geo; Address data; Sorting data
2005	Free newspapers; On Time Mail; Direct Self-mailer
2006	Free newspapers; On Time Mail; Direct Self-mailer; Prepayment Post

Source: Swiss Post

1.3 Process innovation in the Swiss mail sector

Besides product innovations, there has also been important process innovations aimed at reducing cost. For example, Optical character recognition (OCR) technology allowed for introduction of automatic sorting. At Swiss Post Mail, project REMA (re-engineering mail processing), which will be in full operation in 2009, centralizes sorting activities by reducing the number of sorting facilities from eighteen to three (with six sub-centres). This yields large gains from the exploitation of scale economies. Another process innovation will be implemented by the project 'move-it' which introduces flexible working hours in personnel-intensive delivery. Another field of recent process innovation has been the optimization of the postal outlet network. In Switzerland, between 2001 and 2005, the number of full postal outlets was reduced from 3396 to 1767, while 657 outlets with a reduced choice of services and 126 postal agencies were newly created. Many households, beyond the reach of a postal outlet, are now being served with postal products at their doorstep by the postman during his mail delivery tour. During this time period, the overall reduction in access point amounted to 122 only. Swiss Post claims that 600 outlets would be enough for full-area coverage. However, further restructuring is restrained by tight regulation.

2. The driving forces of innovation in mail

It may be argued that the surge in innovation is primarily due to the prospect of liberalization in the mail sector. However, we will show that there are other forces driving innovation which are as important. It may be illustrative to start with a short history of recent legislative developments

in the postal sector. In 1998, Swiss PTT (Post, Telegram, Telegraph) was broken up into Swisscom and Swiss Post operating in the telecommunications and postal markets, respectively. At the same time, Swisscom was fully privatized, while Swiss Post remained in full public ownership under public legal form. Only then did the Swiss government start prescribing concrete profit goals for postal operation. Table 2 summarizes the most important milestones in postal legislation which led to severe restructuring and innovation in this sector.

Table 2 Important milestones in postal legislation

2002	Liberalization schedule for postal market presented by the Swiss government
2003	Reserved area reduction to 100 g in the European Union
2004	Appointment of a regulatory authority for the postal sector in Switzerland
2004	Reserved area reduction to 1 kg (parcels) in Switzerland
2006	Reserved area reduction from 100 g to 50 g in the European Union Reserved area reduction from 1 kg to 100 g Switzerland

Source: Swiss Post

At the same time, new technologies have become available, enabling deep restructuring of the mail process. Hence, besides the mere prospect of liberalization, there are three major forces governing innovation.

- **Guidelines by the regulatory authority** Only in 1998, with the break-up of the PTT, the Swiss government started to stipulate considerable profit from the Swiss Post. Prior to this, there was at most an informal instruction to break even with no incentives to improve.
- **Technological progress** The emergence of ubiquitous availability of information technology allowed for the convergence of classic and electronic mail services, leading to the introduction of innovative products. Moreover, only recent technology advancements allow for a centralization of mail processing and network optimization.
- **Deregulation** Deregulation gives a postal operator more freedom in its organizational structure, but also in its range of products and pricing. For instance, the recent re-engineering of mail processing in Switzerland has been made possible through the possibility to reduce its workforce and centralize production. Deregulation also reduces the scope of USO, such as by allowing postal operators to reduce the number of outlets or merge them with local grocery stores. This also contributes to increased flexibility in the market.

We conclude that the relationship between competitive pressure and innovation is rather a correlation than the effect of strict causality. There may be no direct economic relationship, but

rather a political one—only the prospect of competition allows the politically responsible authorities to implement unpopular measures enhancing efficiency and endorsing cost-cutting measures by a postal operator.

3. The effects of liberalization and regulation

The following considerations are based on a stylized market for mail delivery.² Consider a setting of imperfect monopolistic competition in which the incumbent postal operator faces bounded price-elasticity of demand. We further assume that product innovation induces higher mail volumes. Then, the postal operator's marginal benefit, with respect to product innovation is higher since the mark-up over marginal cost applies to the larger quantity. A higher mark-up induces increased investment in product innovation. This effect is smaller when the incumbent's market share is lower. Hence, competition directly reduces innovation incentives at that margin. An increase in the price elasticity of demand lowers the optimum price and thereby raises quantity. Hence the effect of an increase in price elasticity of demand on a product innovation is ambiguous.

A change in marginal cost, which may be induced by regulation, has two opposite effects on product innovation. On one hand, by inducing a higher optimum price, it decreases quantity and therefore reduces the incentives to innovate. On the other hand, increase in the absolute mark-up encourages product innovation aimed at increasing volume.

As to process innovation, marginal benefit emerges from higher quantity demand due to a lower optimum price as above. This effect is greater the higher the incumbent's market share and the more price elastic the consumer demand. Another benefit arises from an increasing mark-up due to improved processes, which is tightened by high unit processing cost. However, an increase in the perceived price elasticity of demand lowers the mark-up, making process innovation less attractive. This effect prevails if the incumbent's overall demand is low. Hence, its overall effect on process innovation is ambiguous. Liberalization (that is, market opening) increases competitive pressure in the market. There are two effects associated with it. First, the price elasticity of individual demand is increased. While the market price elasticity of demand is not affected, individuals now have a choice among several operators through a positive switching elasticity. Second, market opening reduces the incumbent's market share.

There are two main adverse effects of competition on innovation. First, competition reduces the incumbent's quantity and hence the basis for the redemption of his/her investment in process innovation. Second, the attainable mark-up shrinks, such that gains in productivity have to be

² The discussion is based on a small theoretical model discussed in Jaag (2007a).

A more detailed model of the Swiss market for mail delivery is given in Jaag (2007b).

passed on to consumers. In our considerations, product and process innovation complement each other, and a reduction in process innovation drags down product innovation as well. Our considerations are much in line with Dietl, Grütter, and Lutzenberger (2006) in that it is quantity demanded which primarily drives the incentives to innovate.

On the other hand, deregulation and a reduction in the scope of USO reduce a postal operator's cost all else being equal. This gives rise to a lower price in equilibrium and higher quantity. Hence, the same reasoning as with respect to liberalization applies, albeit with a different (positive) sign.

4. Conclusion

In this paper we have studied the effect of competition due to liberalization in the postal sector on the incumbent's incentives to innovate. Product innovation bears a stimulating effect on demand while process innovation lowers unit cost. In recent years, Swiss Post Mail introduced many innovations – seemingly due to the impending opening of the letter market. We argue that there is no direct economic effect of competition on innovation but rather a political one. The dawn of competition enabled the government to sharpen the profitability demand for Swiss Post. This and the emergence of the relevant technologies (and the approval to use them) led the operator to restructuring and innovation. The effect of competition on product and process innovation in our considerations can be summarized as follows—a reduction in market share reduces investment in product and process innovation unambiguously. This is the standard effect known from the industrial-organization-literature that competition reduces monopoly rents and therefore innovation incentives. An increase in the consumers' price sensibility reduces investment in product innovation if marginal cost is high. Its effect on process innovation is negative as well if volumes are low.

Deregulation reduces cost, which in equilibrium is translated into a lower price. Higher resulting volumes increase the operator's incentives to invest both in product and process innovation. Our considerations show that the forthcoming full liberalization of postal markets in Europe should be accompanied deregulation measures. The creation of increase commercial freedom for incumbent postal operators in their reaction to increased competition is the key to keeping incentives to innovate high in the postal future.

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